1985, would be reduced to $ 80x and $ 100x, respectively. Under the consistency rule in section 41(c)(5) and paragraph (d)(1) of this section, to compute the research credit for the tax year ending December 31, 2001, X must reduce its qualified research expenses for 1984 and 1985 to reflect the change in the definition of qualified research for taxable years beginning after December 31, 1985. Thus, X's total qualified research expenses for the fixed-base period (1984–1988) to be used in computing the fixed-base percentage is $80 + 100 + 150 + 180 + 170 = $680x.

Example 2. The facts are the same as in *Example 1,* except that, in computing its qualified research expenses for the taxable year ending December 31, 2001, X claimed that a certain type of expenditure incurred in 2001 was a qualified research expense. X's claim reflected a change in X's position, because X had not previously claimed that similar expenditures were qualified research expenses. The consistency rule requires X to adjust its qualified research expenses in computing the fixed-base percentage to include any similar expenditures not treated as qualified research expenses during the fixed-base period, regardless of whether the period for filing a claim for credit or refund has expired for any year taken into account in computing the fixed-base percentage.

(e) *Effective date.* The rules in paragraphs (c) and (d) of this section are applicable for taxable years beginning on or after the date final regulations are published in the FEDERAL REGISTER.

[T.D. 8930, 66 FR 289, Jan. 3, 2001]

§ 1.41–4 Qualified research for expenditures paid or incurred on or after January 3, 2001.

(a) *Qualified research*—(1) *General rule.* Research activities related to the development or improvement of a business component constitute qualified research only if the research activities meet all of the requirements of section 41(d)(1) and this section, and are not otherwise excluded under section 41(d)(3)(B) or (d)(4), or this section.

(2) *Requirements of section 41(d)(1).* Research constitutes qualified research only if it is research—

(i) With respect to which expenditures may be treated as expenses under section 174, see §1.174–2;

(ii) That is undertaken for the purpose of discovering information that is technological in nature, and the application of which is intended to be useful in the development of a new or improved business component of the taxpayer; and

(iii) Substantially all of the activities of which constitute elements of a process of experimentation that relates to a new or improved function, performance, reliability or quality.

For certain recordkeeping requirements, see paragraph (d) of this section.

(3) *Undertaken for the purpose of discovering information*—(i) *In general.* For purposes of section 41(d) and this section, research is undertaken for the purpose of discovering information only if it is undertaken to obtain knowledge that exceeds, expands, or refines the common knowledge of skilled professionals in a particular field of science or engineering. A determination that research is undertaken for the purpose of discovering information does not require that the taxpayer succeed in obtaining the knowledge that exceeds, expands, or refines the common knowledge of skilled professionals in a particular field of science or engineering, nor does it require that the advance sought be more than evolutionary. However, research is not undertaken for the purpose of discovering information merely because an expenditure may be treated as an expense under section 174.

(ii) *Common knowledge.* Common knowledge of skilled professionals in a particular field of science or engineering means information that should be known to skilled professionals had they performed, before the research in question is undertaken, a reasonable investigation of the existing level of information in the particular field of science or engineering. Thus, knowledge may, in certain circumstances, exceed, expand, or refine the common knowledge of skilled professionals in a particular field of science or engineering even though such knowledge has previously been obtained by other persons. For example, trade secrets generally are not within the common knowledge of skilled professionals in a particular field of science or engineering because they are not reasonably available to skilled professionals not employed, hired, or licensed by the owner of such trade secrets.

(iii) *Means of discovery.* In seeking to obtain knowledge that exceeds, expands, or refines the common knowledge of skilled professionals in a particular field of science or engineering, a taxpayer may employ existing technologies in a particular field and may rely on existing principles of science or engineering.

(iv) *Patent safe harbor.* For purposes of section 41(d) and paragraph (a)(3)(i) of this section, the issuance of a patent by the Patent and Trademark Office under the provisions of section 151 of title 35, United States Code (other than a patent for design issued under the provisions of section 171 of title 35, United States Code) is conclusive evidence that a taxpayer has obtained knowledge that exceeds, expands, or refines the common knowledge of skilled professionals. However, the issuance of such a patent is not a precondition for credit availability.

(v) *Rebuttable presumption.* If a taxpayer demonstrates with credible evidence that research activities were undertaken to obtain the information described in the taxpayer's contemporaneous documentation required under paragraph (d)(1) of this section, and if that documentation also sets forth the basis for the taxpayer's belief that obtaining this information would exceed, expand, or refine the common knowledge of skilled professionals in the particular field of science or engineering, the research activities are presumed to satisfy the requirements of this paragraph (a)(3). However, the presumption applies only if the taxpayer cooperates with reasonable requests by the Commissioner for witnesses, information, documents, meetings, and interviews. Furthermore, the Commissioner may overcome the presumption in this paragraph if the Commissioner demonstrates that the information described in the taxpayer's documentation was within the common knowledge of skilled professionals (as described in paragraph (a)(3)(ii) of this section), or that the research activities were not undertaken to obtain the information described in the taxpayer's documentation.

(4) *Technological in nature.* For purposes of section 41(d) and this section, information is technological in nature if the process of experimentation used to discover such information fundamentally relies on principles of the physical or biological sciences, engineering, or computer science.

(5) *Process of experimentation.* For purposes of section 41(d) and this section, a process of experimentation is a process to evaluate more than one alternative designed to achieve a result where the capability or method of achieving that result is uncertain at the outset. A process of experimentation does not include the evaluation of alternatives to establish the appropriate design of a business component, if the capability and method for developing or improving the business component are not uncertain. A process of experimentation in the physical or biological sciences, engineering, or computer science may involve—

(i) Developing one or more hypotheses designed to achieve the intended result;

(ii) Designing an experiment (that, where appropriate to the particular field of research, is intended to be replicable with an established experimental control) to test and analyze those hypotheses (through, for example, modeling, simulation, or a systematic trial and error methodology);

(iii) Conducting the experiment; and

(iv) Refining or discarding the hypotheses as part of a sequential design process to develop or improve the business component.

(6) *Substantially all requirement.* The substantially all requirement of section 41(d)(1)(C) and paragraph (a)(2)(iii) of this section is satisfied only if 80 percent or more of the research activities, measured on a cost or other consistently applied reasonable basis (and without regard to §1.41–2(d)(2)), constitute elements of a process of experimentation for a purpose described in section 41(d)(3). The substantially all requirement is applied separately to each business component.

(7) *Use of computers and information technology.* The employment of computers or information technology, or the reliance on principles of computer science or information technology to store, collect, manipulate, translate, disseminate, produce, distribute, or

process data or information, and similar uses of computers and information technology does not itself establish that qualified research has been undertaken.

(8) *Illustrations.* The following examples illustrate the application of this paragraph (a):

Example 1. (i) *Facts.* X and other manufacturing companies have previously designed and manufactured a particular kind of machine using Material S. Material T is less expensive than Material S. X wishes to design a new machine that appears and functions exactly the same as its existing machines, but that is made of Material T instead of Material S. The capability and method necessary to achieve this objective should not have been known to skilled professionals had they conducted a reasonable investigation of the existing information in the relevant field of science or engineering at the time the research was undertaken.

(ii) *Conclusion.* X's activities to design the new machine using Material T may be qualified research within the meaning of section 41(d)(1) and this paragraph (a). In seeking to design the machine, X undertook to obtain knowledge that exceeds, expands, or refines the common knowledge of skilled professionals in the relevant field of science or engineering.

Example 2. (i) *Facts.* X is engaged in the business of developing and manufacturing widgets. X wants to manufacture an improved widget made out of a material that X has not previously used. Although X is uncertain how to use the material to manufacture an improved widget, the capability and method of using the material to manufacture such widgets should have been known to skilled professionals had they conducted a reasonable investigation of the existing level of information in the particular field of science or engineering at the time the research was undertaken.

(ii) *Conclusion.* Even though X's expenditures for the activities to resolve the uncertainty in manufacturing the improved widget may be treated as expenses for research activities under section 174 and §1.174–2, X's activities to resolve the uncertainty in manufacturing the improved widget are not qualified research within the meaning of section 41(d) and this paragraph (a). Although X's activities were intended to eliminate uncertainty, the activities were not undertaken to obtain knowledge that exceeds, expands, or refines the common knowledge of skilled professionals in the relevant field of science or engineering.

Example 3. (i) *Facts.* X desires to build a bridge that can sustain greater traffic flow without deterioration than can existing bridges. The capability and method used to build such a bridge should not have been known to skilled professionals had they conducted a reasonable investigation of the existing level of information in the particular field of science or engineering at the time the research was undertaken. X eventually abandons the project after attempts to develop the technology prove unsuccessful.

(ii) *Conclusion.* X's activities to develop the technology to build the bridge may be qualified research within the meaning of section 41(d)(1) and this paragraph (a), regardless of the fact that X did not actually succeed in developing that technology. In seeking to develop the technology, X undertook to obtain knowledge that exceeds, expands, or refines the common knowledge of skilled professionals in the relevant field of science or engineering.

Example 4. (i) *Facts.* The facts are the same as in *Example 3*, except that Y successfully builds a bridge that can sustain the greater traffic flow. Thereafter, Z seeks to build a bridge that can also sustain such greater traffic flow. The method Y used to build its bridge is a closely guarded trade secret that is not known to Z and should not have been known to skilled professionals had they conducted a reasonable investigation of the existing level of information in the particular field of science or engineering at the time the research was undertaken.

(ii) *Conclusion.* Z's activities to develop the technology to build the bridge may be qualified research within the meaning of section 41(d)(1) and this paragraph (a), even if it so happens that the technology Z used to build its bridge is similar or identical to the technology Y used. In developing the technology, Z undertook to obtain knowledge that exceeds, expands, or refines the common knowledge of skilled professionals in the relevant field of science or engineering.

Example 5. (i) *Facts.* X, a widget manufacturer, seeks to develop a new widget and initiates Project A. Before or during the early stages of Project A, X's employees prepare contemporaneous documentation that describes the principal questions to be answered by Project A and the information that X seeks to obtain to exceed, expand, or refine the common knowledge of skilled professionals in the relevant field of science or engineering. The documentation includes a statement from one of X's skilled professionals setting forth the basis for that professional's belief that the information is beyond the common knowledge of skilled professionals in the relevant field. Upon examination by the Commissioner, X presents credible evidence that the research activities were undertaken to obtain the information described in the contemporaneous documentation. X cooperates with all requests by the IRS for witnesses, information, documents, meetings, and interviews.

(ii) *Conclusion.* X's research activities with respect to Project A are presumed to be undertaken for the purpose of obtaining knowledge that exceeds, expands, or refines the common knowledge of skilled professionals in the relevant field of science or engineering. The Commissioner may overcome this presumption by demonstrating that the information X sought to obtain was within the common knowledge of skilled professionals in the relevant field of science or engineering (*i.e.*, by demonstrating that, at the time Project A began, the information should have been known to skilled professionals had they performed a reasonable investigation of the existing level of knowledge in the relevant field).

(b) *Application of requirements for qualified research*—(1) *In general.* The requirements for qualified research in section 41(d)(1) and paragraph (a) of this section, must be applied separately to each business component, as defined in section 41(d)(2)(B). In cases involving development of both a product and a manufacturing or other commercial production process for the product, research activities relating to development of the process are not qualified research unless the requirements of section 41(d) and this section are met for the research activities relating to the process without taking into account the research activities relating to development of the product. Similarly, research activities relating to development of the product are not qualified research unless the requirements of section 41(d) and this section are met for the research activities relating to the product without taking into account the research activities relating to development of the manufacturing or other commercial production process.

(2) *Shrinking-back rule.* The requirements of section 41(d) and paragraph (a) of this section are to be applied first at the level of the discrete business component, that is, the product, process, computer software, technique, formula, or invention to be held for sale, lease, or license, or used by the taxpayer in a trade or business of the taxpayer. If the requirements for credit eligibility are met at that first level, then some or all of the taxpayer's research expenses are eligible for the credit. A special shrinking-back rule applies in the case where a taxpayer incurs some research expenses with respect to that discrete business component that would constitute qualified research expenses with respect to that business component but for the fact that less than substantially all of the research activities with respect to that component constitute elements of a process of experimentation that relates to a new or improved function, performance, reliability or quality. In such a case, the requirements for the credit are to be applied at the next most significant subset of elements of the business component. The shrinking-back of the applicable business component continues until a subset or series of subsets of elements of the business component satisfies substantially all requirements of section 41(d)(1)(C) and paragraph (a)(2)(iii) of this section (treating that subset of elements as a business component) or the most basic element fails to satisfy the requirements. This shrinking-back rule is applied only if a taxpayer does not satisfy the requirements of section 41(d)(1)(C) and paragraph (a)(2)(iii) of this section with respect to the overall business component. The shrinking-back rule is not itself applied as a reason to exclude research activities from credit eligibility.

(3) *Illustration.* The following example illustrates the application of this paragraph (b):

(i) *Facts.* X, a widget manufacturer, develops a widget that is improved in several respects. Among the various improvements to the widget is an improvement to the widget's cooling mechanism. Although the capability and method of making the other improvements to the widget would have been known to skilled professionals had they conducted a reasonable investigation of the existing level of information in the particular field of science or engineering, the method of developing the improved cooling mechanism and of incorporating the improved mechanism into the widget would not have been known to skilled professionals had they conducted a reasonable investigation of the existing level of information in the particular field of science or engineering. Substantially all of X's research activities in improving the widget constitute elements of a process of experimentation

for purposes of improving the performance of the widget. None of X's research activities in improving the widget are described in section 41(d)(4) or paragraph (c) of this section.

(ii) *Conclusion.* Some, but not all, of X's research activities in developing the improved widget are qualified research within the meaning of section 41(d)(1) and paragraph (a) of this section. In seeking to improve the widget, some of X's activities (related to improving the cooling mechanism and incorporating the improved cooling mechanism into the widget) were undertaken to obtain knowledge that exceeds, expands, or refines the common knowledge of skilled professionals in the relevant field of science or engineering. However, other activities (related to the other improvements) were not undertaken to obtain knowledge that exceeds, expands, or refines the common knowledge of skilled professionals in the relevant field of science or engineering, and thus are not qualified research and are not eligible for the credit. Not all of X's research activities relating to the widget are eligible for the credit because some of the activities are not qualified research as defined in section 41(d) and paragraph (a) of this section, even though the widget qualifies as a business component with respect to which qualified research that satisfies the requirements of section 41(d) and paragraph (a) of this section is undertaken.

(c) *Excluded activities*—(1) *In general.* Qualified research does not include any activity described in section 41(d)(4) and paragraph (c) of this section.

(2) *Research after commercial production*—(i) *In general.* Activities conducted after the beginning of commercial production of a business component are not qualified research. Activities are conducted after the beginning of commercial production of a business component if such activities are conducted after the component is developed to the point where it is ready for commercial sale or use, or meets the basic functional and economic requirements of the taxpayer for the component's sale or use.

(ii) *Certain additional activities related to the business component.* The following activities are deemed to occur after the beginning of commercial production of a business component—

(A) Preproduction planning for a finished business component;

(B) Tooling-up for production;

(C) Trial production runs;

(D) Trouble shooting involving detecting faults in production equipment or processes;

(E) Accumulating data relating to production processes; and

(F) Debugging flaws in a business component.

(iii) *Activities related to production process or technique.* In cases involving development of both a product and a manufacturing or other commercial production process for the product, the exclusion described in section 41(d)(4)(A) and paragraphs (c)(2)(i) and (ii) of this section applies separately for the activities relating to the development of the product and the activities relating to the development of the process. For example, even after a product meets the taxpayer's basic functional and economic requirements, activities relating to the development of the manufacturing process still may constitute qualified research, provided that the development of the process itself separately satisfies the requirements of section 41(d) and this section, and the activities are conducted before the process meets the taxpayer's basic functional and economic requirements or is ready for commercial use.

(iv) *Clinical testing.* Clinical testing of a pharmaceutical product prior to its commercial production in the United States is not treated as occurring after the beginning of commercial production even if the product is commercially available in other countries. Additional clinical testing of a pharmaceutical product after a product has been approved for a specific therapeutic use by the Food and Drug Administration and is ready for commercial production and sale are not treated as occurring after the beginning of commercial production if such clinical tests are undertaken to establish new functional uses, characteristics, indications, combinations, dosages, or delivery forms for the product. A functional use, characteristic, indication, combination, dosage or delivery form shall

be considered new only if such functional use, characteristic, indication, combination, dosage or delivery form must be approved by the Food and Drug Administration.

(3) *Adaptation of existing business components.* Activities relating to adapting an existing business component to a particular customer's requirement or need are not qualified research. This exclusion does not apply merely because a business component is intended for a specific customer.

(4) *Duplication of existing business component.* Activities relating to reproducing an existing business component (in whole or in part) from a physical examination of the business component itself or from plans, blueprints, detailed specifications, or publicly available information about the business component are not qualified research. This exclusion does not apply merely because the taxpayer inspects an existing business component in the course of developing its own business component.

(5) *Surveys, studies, research relating to management functions, etc.* Qualified research does not include activities relating to—

(i) Efficiency surveys;

(ii) Management functions or techniques, including such items as preparation of financial data and analysis, development of employee training programs and management organization plans, and management-based changes in production processes (such as rearranging work stations on an assembly line);

(iii) Market research, testing, or development (including advertising or promotions);

(iv) Routine data collections; or

(v) Routine or ordinary testing or inspections for quality control.

(6) *Internal-use computer software*—(i) *General rule.* Research with respect to computer software that is developed by (or for the benefit of) the taxpayer primarily for the taxpayer's internal use is eligible for the research credit only if the software satisfies the requirements of paragraph (c)(6)(ii) of this section.

(ii) *Requirements.* The requirements of this paragraph (c)(6)(ii) are—

(A) The research satisfies the requirements of section 41(d)(1);

(B) The research is not otherwise excluded under section 41(d)(4) (other than section 41(d)(4)(E)); and (C) One of the following conditions is met—

(*1*) The taxpayer develops the software for use in an activity that constitutes qualified research (other than the development of the internal-use software itself);

(*2*) The taxpayer develops the software for use in a production process that meets the requirements of section 41(d)(1);

(*3*) The taxpayer develops a new or improved package of computer software and hardware together as a single product, of which the software is an integral part, that is used directly by the taxpayer in providing technological services in its trade or business to customers. In these cases, eligibility for the research credit is to be determined by examining the combined hardware-software product as a single product;

(*4*) The taxpayer develops the software for use in providing computer services to customers; or

(*5*) The software satisfies the high threshold of innovation test of paragraph (c)(6)(vi) of this section.

(iii) *Primarily for internal use.* Software is developed primarily for the taxpayer's internal use if the software is to be used internally, for example, in general administrative functions of the taxpayer (such as payroll, bookkeeping, or personnel management) or in providing noncomputer services (such as accounting, consulting or banking services). If computer software is developed primarily for the taxpayer's internal use, the requirements of paragraph (c)(6) apply even though the taxpayer intends to, or subsequently does, sell, lease, or license the computer software.

(iv) *Software used in the provision of services*—(A) *Computer services.* For purposes of this section, a computer service is a service offered by a taxpayer to customers who conduct business with the taxpayer primarily for the use of the taxpayer's computer or software technology. A taxpayer does not provide a computer service merely because customers interact with the taxpayer's software.

(B) *Noncomputer services.* For purposes of this section, a noncomputer service is a service offered by a taxpayer to customers who conduct business with the taxpayer primarily to obtain a service other than a computer service, even if such other service is enabled, supported, or facilitated by computer or software technology.

(v) *Exception for certain software used in providing noncomputer services.* The requirements of paragraph (c)(6)(ii)(C) of this section are deemed satisfied for research with respect to computer software if, at the time the research was undertaken—

(A) The software is designed to provide customers a new feature with respect to a noncomputer service;

(B) The taxpayer reasonably anticipated that customers would choose to obtain the noncomputer service from the taxpayer (rather than from the taxpayer's competitors) because of those new features provided by the software; and (C) Those new features were not available from any of the taxpayer's competitors.

(vi) *High threshold of innovation test.* Computer software satisfies the high threshold of innovation test of this paragraph (c)(6)(vi) only if the taxpayer can establish that—

(A) The software is innovative in that the software is intended to result in a reduction in cost, improvement in speed, or other improvement, that is substantial and economically significant;

(B) The software development involves significant economic risk in that the taxpayer commits substantial resources to the development and there is a substantial uncertainty, because of technical risk, that such resources would be recovered within a reasonable period; and

(C) The software is not commercially available for use by the taxpayer in that the software cannot be purchased, leased, or licensed and used for the intended purpose without modifications that would satisfy the requirements of paragraphs (c)(6)(vi)(A) and (B) of this section.

(vii) *Application of high threshold of innovation test.* In determining if the high threshold of innovation test of paragraph (c)(6)(vi) of this section is satisfied, all of the facts and circumstances are considered. The determination of whether the software is intended to result in an improvement or cost reduction that is substantial and economically significant is based on a comparison of the intended result with software that is within the common knowledge of skilled professionals in the relevant field of science or engineering, see §1.41–4(a)(3)(ii). Similarly, the extent of uncertainty and technical risk is determined with respect to the common knowledge of skilled professionals in the relevant field of science or engineering. Further, in determining if the high threshold of innovation test of paragraph (c)(6)(vi) of this section is satisfied, the activities to develop the new or improved software are considered independent of the effect of any modifications to related hardware or other software.

(viii) *Illustrations.* The following examples illustrate the application of this paragraph (c)(6):

Example 1. (i) *Facts.* X is engaged in the business of manufacturing and selling widgets to wholesalers. X has experienced strong growth and at the same time has expanded its product offerings. X also has increased significantly the size of its business by expanding into new territories. The increase in the size and scope of its business has strained X's existing financial management systems such that management can no longer obtain timely comprehensive financial data. Accordingly, X undertakes the development of a financial management computer software system that is more appropriate to its newly expanded operations.

(ii) *Conclusion.* X's new computer software system is developed by X primarily for X's internal use. X's activities to develop the new computer software system may be eligible for the research credit only if the computer software development activities satisfy the requirements of paragraph (c)(6)(ii) of this section.

Example 2. (i) *Facts.* X is engaged in the business of designing, manufacturing, and selling widgets. X delivers its widgets in the same manner and time as its competitors. In keeping with X's corporate commitment to provide customers with top quality service, X undertakes a project to develop for X's internal use a computer software system to facilitate the tracking of the manufacturing and delivery of widgets which will enable X's customers to monitor the progress of their orders and know precisely when their widgets will be delivered. X's computer software activities include research activities that

satisfy the discovery requirement in section 41(d)(1) and paragraph (a)(3) of this section. At the time the research is undertaken, X reasonably anticipates that if it is successful, X will increase its market share as compared to X's competitors, none of which has such a tracking feature for its delivery system.

(ii) *Conclusion.* Although X's computer software system is developed primarily for X's internal use, X's activities are excepted from the high threshold of innovation test of paragraph (c)(6)(vi) of this section because, at the time the research is undertaken, X's software is designed to provide improved tracking features, X reasonably anticipates that customers will purchase widgets from X because these improved tracking features, and because comparable tracking features are not available from any of X's competitors.

(ix) *Effective dates.* This paragraph (c)(6) is applicable for taxable years beginning after December 31, 1985, except paragraphs (c)(6)(ii)(C)(*4*), (c)(6)(iv)(A) and (B), (c)(6)(v), the second and third sentences of paragraph (c)(6)(vii), and paragraph (c)(6)(viii) *Example 2* of this section apply to expenditures paid or incurred on or after January 3, 2001.

(7) *Activities outside the United States, Puerto Rico, and other possessions*—(i) *In general.* Research conducted outside the United States, as defined in section 7701(a)(9), the Commonwealth of Puerto Rico and other possessions of the United States does not constitute qualified research.

(ii) *Apportionment of in-house research expenses.* In-house research expenses paid or incurred for qualified services performed both (A) in the United States, the Commonwealth of Puerto Rico and other possessions of the United States and (B) outside the United States, the Commonwealth of Puerto Rico and other possessions of the United States must be apportioned between the services performed in the United States, the Commonwealth of Puerto Rico and other possessions of the United States and the services performed outside the United States, the Commonwealth of Puerto Rico and other possessions of the United States. Only those in-house research expenses apportioned to the services performed within the United States, the Commonwealth of Puerto Rico and other possessions of the United States are eligible to be treated as qualified research expenses, unless the in-house research expenses are wages and the 80 percent rule of §1.41–2(d)(2) applies.

(iii) *Apportionment of contract research expenses.* If contract research is performed partly in the United States, the Commonwealth of Puerto Rico and other possessions of the United States and partly outside the United States, the Commonwealth of Puerto Rico and other possessions of the United States, only 65 percent (or 75 percent in the case of amounts paid to qualified research consortia) of the portion of the contract amount that is attributable to the research activity performed in the United States, the Commonwealth of Puerto Rico and other possessions of the United States may qualify as a contract research expense (even if 80 percent or more of the contract amount is for research performed in the United States, the Commonwealth of Puerto Rico and other possessions of the United States).

(8) *Research in the social sciences, etc.* Qualified research does not include research in the social sciences (including economics, business management, and behavioral sciences), arts, or humanities.

(9) *Research funded by any grant, contract, or otherwise.* Qualified research does not include any research to the extent funded by any grant, contract, or otherwise by another person (or governmental entity). To determine the extent to which research is so funded, §1.41–4A(d) applies.

(10) *Illustrations.* The following examples illustrate provisions contained in paragraphs (c)(1) through (9) of this section. No inference should be drawn from these examples concerning the application of section 41(d)(1) and paragraph (a) of this section to these facts. The examples are as follows:

Example 1. (i) *Facts.* X, a tire manufacturer, seeks to build a tire that will not deteriorate as rapidly under certain conditions of high speed and temperature as do existing tires. X commences laboratory research on January 1. On April 1, X determines in the laboratory that a certain combination of materials and additives can withstand higher rotational speeds and temperatures than the combination of materials and additives used in existing tires. On the basis of this determination, X undertakes further research activities to determine how to design a tire using those

materials and additives, and to determine whether such a tire functions outside the laboratory as intended under various actual road conditions. By September 1, X's research has progressed to the point where the new tire meets X's basic functional and economic requirements.

(ii) *Conclusion.* Any research activities conducted by X after September 1 with respect to the design of the tire are not qualified research within the meaning of section 41(d)(1) and paragraph (a) of this section because they are undertaken after the beginning of commercial production of the tire. Whether any activities X engaged in to develop a process for manufacturing the new tire constitute qualified research depends on if the development of the process itself separately satisfies the requirements of section 41(d) and paragraph (c)(2) of this section, and also depends on if the activities occur before the point in time when the process meets the taxpayer's basic functional and economic requirements or is ready for commercial use.

Example 2. (i) *Facts.* For several years, X has manufactured and sold a particular kind of widget. X initiates a new research project to develop an improved widget.

(ii) *Conclusion.* X's activities to develop an improved widget are not excluded from the definition of qualified research under section 41(d)(4)(A) and paragraph (c)(2) of this section until the beginning of commercial production of the improved widget. The fact that X's activities relating to the improved widget are undertaken after the beginning of commercial production of the unimproved widget does not bar the activities from credit eligibility because those activities constitute a new research project to develop a new business component, an improved widget.

Example 3. (i) *Facts.* X, a computer software development firm, owns all substantial rights in a general ledger accounting software core program that X markets and licenses to customers. X incurs expenditures in adapting the core software program to the requirements of C, one of X's customers.

(ii) *Conclusion.* Because X's activities represent activities to adapt an existing software program to a particular customer's requirement, X's activities are excluded from the definition of qualified research under section 41(d)(4)(B) and paragraph (c)(3) of this section.

Example 4. (i) *Facts.* The facts are the same as in *Example 3*, except that C pays X to adapt the core software program to C's requirements.

(ii) *Conclusion.* Because X's activities are excluded from the definition of qualified research under section 41(d)(4)(B) and paragraph (c)(3) of this section, C's payments to X do not constitute contract research expenses under section 41(b)(3)(A).

Example 5. (i) *Facts.* The facts are the same as in Example 3, except that C's own employees adapt the core software program to C's requirements.

(ii) *Conclusion.* Because C's employees' activities are excluded from the definition of qualified research under section 41(d)(4)(B) and paragraph (c)(3) of this section, the wages C paid to its employees do not constitute in-house research expenses under section 41(b)(2)(A).

Example 6. (i) *Facts.* An existing gasoline additive is manufactured by Y using three ingredients, A, B, and C. X seeks to develop and manufacture its own gasoline additive that appears and functions in a manner similar to Y's additive. To develop its own additive, X first inspects the composition of Y's additive, and uses knowledge gained from the inspection to reproduce A and B in the laboratory. Any differences between ingredients A and B that are used in Y's additive and those reproduced by X are insignificant and are not material to the viability, effectiveness, or cost of A and B. X desires to use with A and B an ingredient that has a materially lower cost than ingredient C. Accordingly, X engages in a process of experimentation to discover potential alternative formulations of the additive (*i.e.*, the development and use of various ingredients other than C to use with A and B).

(ii) *Conclusion.* X's activities in analyzing and reproducing ingredients A and B involve duplication of existing business components and are excluded from qualified research under section 41(d)(4)(C) and paragraph (c)(4) of this section. X's experimentation activities to discover potential alternative formulations of the additive do not involve duplication of an existing business component and are not excluded from qualified research under section 41(d)(4)(C) and paragraph (c)(4) of this section.

Example 7. (i) *Facts.* X, an insurance company, develops a new life insurance product. In the course of developing the product, X engages in research with respect to the effect of pricing and tax consequences on demand for the product, the expected volatility of interest rates, and the expected mortality rates (based on published data and prior insurance claims).

(ii) *Conclusion.* X's activities related to the new product represent research in the social sciences, and are thus excluded from qualified research under section 41(d)(4)(G) and paragraph (c)(8) of this section.

(d) *Documentation.* No credit shall be allowed under section 41 with regard to an expenditure relating to a research project unless the taxpayer—

(1) Prepares documentation before or during the early stages of the research project, that describes the principal

questions to be answered and the information the taxpayer seeks to obtain to satisfy the requirements of paragraph (a)(3) of this section, and retains that documentation on paper or electronically in the manner prescribed in applicable regulations, revenue rulings, revenue procedures, or other appropriate guidance until such time as taxes may no longer be assessed (except under section 6501(c)(1), (2), or (3)) for any year in which the taxpayer claims to have qualified research expenditures in connection with the research project; and

(2) Satisfies section 6001 and the regulations thereunder.

(e) *Effective dates.* In general, the rules of this section are applicable for expenditures paid or incurred on or after January 3, 2001. The rules of paragraph (d), however, apply to research projects that begin on or after March 5, 2001.

[T.D. 8930, 66 FR 290, Jan. 3, 2001]

§ 1.41–4A Qualified research for taxable years beginning before January 1, 1986.

(a) *General rule.* Except as otherwise provided in section 30(d) (as that section read before amendment by the Tax Reform Act of 1986) and in this section, the term ''qualified research'' means research, expenditures for which would be research and experimental expenditures within the meaning of section 174. Expenditures that are ineligible for the section 174 deduction elections are not expenditures for qualified research. For example, expenditures for the acquisition of land or depreciable property used in research, and mineral exploration costs described in section 174(d), are not expenditures for qualified research.

(b) *Activities outside the United States*—(1) *In-house research.* In-house research conducted outside the United States (as defined in section 7701(a)(9)) cannot constitute qualified research. Thus, wages paid to an employee scientist for services performed in a laboratory in the United States and in a test station in Antarctica must be apportioned between the services performed within the United States and the services performed outside the United States, and only the wages apportioned to the services conducted within the United States are qualified research expenses unless the 80 percent rule of §1.41–2(d)(2) applies.

(2) *Contract research.* If contract research is performed partly within the United States and partly without, only 65 percent of the portion of the contract amount that is attributable to the research performed within the United States can qualify as contract research expense (even if 80 percent or more of the contract amount was for research performed in the United States).

(c) *Social sciences or humanities.* Qualified research does not include research in the social sciences or humanities. For purposes of section 30(d)(2) (as that section read before amendment by the Tax Reform Act of 1986) and of this section, the phrase ''research in the social sciences or humanities'' encompasses all areas of research other than research in a field of laboratory science (such as physics or biochemistry), engineering or technology. Examples of research in the social sciences or humanities include the development of a new life insurance contract, a new economic model or theory, a new accounting procedure or a new cookbook.

(d) *Research funded by any grant, contract, or otherwise*—(1) *In general.* Research does not constitute qualified research to the extent it is funded by any grant, contract, or otherwise by another person (including any governmental entity). All agreements (not only research contracts) entered into between the taxpayer performing the research and other persons shall be considered in determining the extent to which the research is funded. Amounts payable under any agreement that are contingent on the success of the research and thus considered to be paid for the product or result of the research (see §1.41–2(e)(2)) are not treated as funding. For special rules regarding funding between commonly controlled businesses, see §1.41–6(e).

(2) *Research in which taxpayer retains no rights.* If a taxpayer performing research for another person retains no substantial rights in research under the agreement providing for the research, the research is treated as fully funded for purposes of section